Claims PTO
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AMW


Claims 1-68 cancelled.

Claim 69 (new) A hand-supportable digital imaging-based bar code symbol reading device supporting narrow-area and wide-area modes of illumination and image capture, said hand-supportable digital imaging-based bar code symbol reading device comprising:

a hand-supportable housing having a light transmission aperture;

a multi-mode image formation and detection subsystem, disposed in said hand-supportable housing, and having image formation optics for producing a field of view (FOV) upon an object to be imaged and an area-type image sensing array for detecting imaged light reflected off the object during illumination operations in either (i) a narrow-area image capture mode in which a few central rows of pixels on said area-type image sensing array are enabled, or (ii) a wide-area image capture mode in which substantially all rows of said area-type image sensing array are enabled;

a multi-mode LED-based illumination subsystem, disposed in said hand-supportable housing, including (i) a first LED-based illumination array for producing a narrow-area field of narrow-band visible illumination within the FOV of said image formation and detection subsystem during said narrow-area image capture mode, and (ii) a second LED-based illumination array for producing a wide-area field of narrow-band visible illumination within the FOV of said image formation and detection subsystem during said wide-area image capture mode;

an automatic light exposure measurement and illumination control subsystem, disposed in said hand-supportable housing, for supporting the following operations,

(i) automatically driving the first LED-based illumination array when said system is operated in said narrow-area image capture mode, and the second LED-based illumination array when said device is operated in said wide-area image capture mode, so that objects within the FOV of said device are illuminated with said narrow-band visible illumination,

(ii) automatically measuring the light exposure incident upon a central portion of said FOV using a photo-detector independent and separate from said area-type image sensing array, and

(iii) automatically controlling said first and second LED-based illumination arrays so that objects within the FOV of said device are exposed to narrow-band visible illumination having an intensity and a duration sufficient for the formation and detection of high quality digital images at said area-type image sensing array;

an image capturing and buffering subsystem, disposed in said hand-supportable housing, for capturing and buffering 2-D images detected by said image formation and detection subsystem;

a narrow-band optical filter subsystem realized by a high-pass filter element mounted at said light transmission aperture, and a low-pass filter element mounted either before said image sensing array or anywhere after said light transmission aperture, and permitting only said narrow-band visible illumination to be transmitted to said area-type image sensing array, whereas all other components of ambient light collected by said image formation optics are substantially rejected prior to incidence at said area-type image sensing array;

an image-processing based bar code symbol reading subsystem, disposed in said hand-supportable housing, for processing images captured and buffered by said image capturing and buffering subsystem and reading 1-D and 2-D bar code symbols represented;

an input/output subsystem, disposed in said hand-supportable housing, for outputting processed image data to an external host system or other information receiving or responding device; and

a control subsystem, disposed in said hand-supportable housing, for controlling and coordinating said subsystems.

Claim 70 (new): The hand-supportable digital imaging-based bar code symbol reading device of claim 69, which further comprises an IR-based object presence and range detection subsystem for producing an IR-based object detection field within the FOV of said multi-mode image formation and detection subsystem.

Claim 71 (new): The hand-supportable digital imaging-based bar code symbol reading device of claim 69, wherein said multi-mode LED-based illumination subsystem and said automatic light exposure measurement and illumination control subsystem are realized on an illumination board carrying components realizing electronic functions supported by these subsystems.

Claim 72 (new): The hand-supportable digital imaging-based bar code symbol reading device of claim 69, wherein said multi-modeimage formation and detection subsystem is realized on a camera board carrying a high resolution CMOS-type image sensing array with randomly accessible region of interest (ROI) window capabilities.

Claim 73 (new): The hand-supportable digital imaging-based bar code symbol reading device of claim 69, wherein said image-processing bar code reading subsystem is realized on a computing platform including (i) a microprocessor, (ii) an expandable memory, (iii) SDRAM, and (iv) an FPGA FIFO configured to control the camera timings and drive an image acquisition process.

Claim 74 (new): The hand-supportable digital imaging-based bar code symbol reading device of claim 69, wherein said I/O subsystem is realized on an interface board.

Claim 75 (new): The hand-supportable digital imaging-based bar code symbol reading device of claim 70, wherein said IR-based object presence and range detection subsystem comprises an IR-based object presence and range detection circuit.

Claim 76 (new): The hand-supportable digital imaging-based bar code symbol reading device of claim 69, wherein said image capturing and buffering subsystem (i) detects the entire 2-D image focused onto said area-type image sensing array by said image formation optics, (ii) generates a frame of digital pixel data for either a selected region of interest of the captured image frame, or for the entire detected image, and then (iii) buffers each frame of image data as it is captured.